

5.1a Estimating With Finite Sums

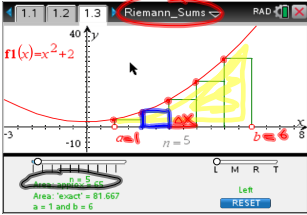
Find the area under the curve $f(x)=x^2+2$ between $x=1$ and $x=6$.

L R A M

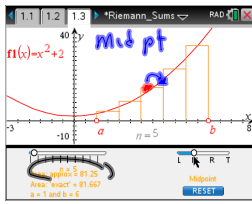
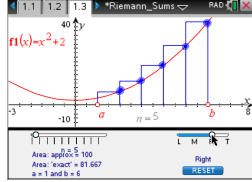
$\Delta x = \frac{b-a}{n} = 1$

$\Delta x = \frac{b-a}{n}$

$x_0 = 1 \quad y_0 = 3$
 $x_1 = 2 \quad y_1 = 6.1$
 $x_2 = 3 \quad y_2 = 11$
 $x_3 = 4 \quad y_3 = 18$
 $x_4 = 5 \quad y_4 = 27$
 ~~$x_5 = 6$~~



L R A M = 65



R R A M

~~$x_0 = 1$~~

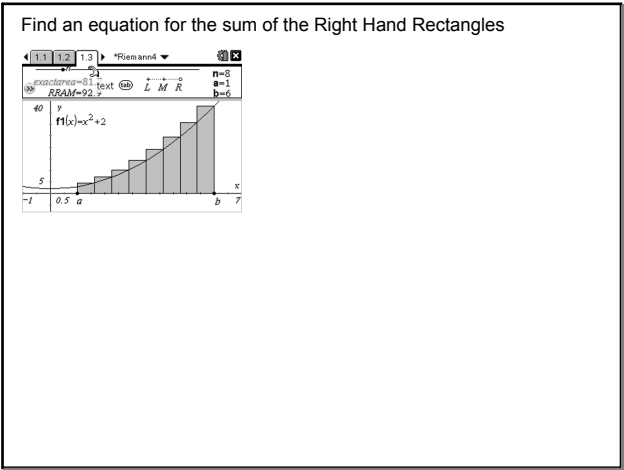
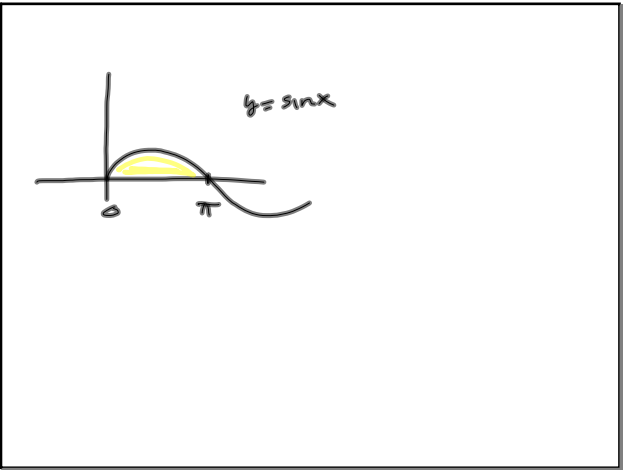
$x_1 = 2 \quad y_1 = 6.1$
 $x_2 = 3 \quad y_2 = 11.1$
 $x_3 = 4 \quad y_3 = 18.1$
 $x_4 = 5 \quad y_4 = 27.1$
 $x_5 = 6 \quad y_5 = 38.1$

$y_1 = 1.5 \quad y_1 = 1.5^2 + 2 = 4.25$
 $x_2 = 2.5$
 $x_3 = 3.5$
i

M R A M

Nov 8-7:30 PM

Nov 2-10:10 AM



Nov 2-12:38 PM

Nov 8-7:50 PM

define an rram function

New

Name: rram

Type: Function

Library Access: LibPub (Show Catalog)

OK Cancel

1.1 1.2

rram

Define LibPub rram(a,b,n)=

Func

Return $\sum_{i=1}^n (f(a+i \cdot dx)) \cdot dx \cdot \frac{b-a}{n}$

EndFunc

Save in mylib. Refresh libraries

Nov 8-8:15 PM

lram and mram

1.1 1.2

lram

Define LibPub lram(a,b,n)=

Func

Return $\sum_{i=0}^{n-1} (f(a+i \cdot dx)) \cdot dx \cdot \frac{b-a}{n}$

EndFunc

1.1 1.2

mram

Define LibPub mram(a,b,n)=

Func

Return $\sum_{i=0}^{n-1} (f(a+\frac{dx}{2}+i \cdot dx)) \cdot dx \cdot \frac{b-a}{n}$

EndFunc

Nov 8-8:59 PM

Example 2

1.1 1.2

Define f(x)=x^2 sin(x) Done

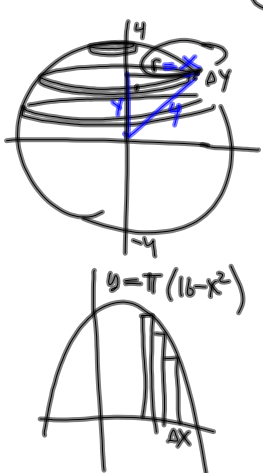
lram(0,3,50) 5.81235

lram(0,3,100) 5.75701

lram(0,3,1000) 5.77667

Nov 8-8:58 PM

Estimate the volume of a sphere with radius 4.



$\Delta A = \pi r^2 \Delta y$

$x^2 + y^2 = 4^2$

$x^2 = 16 - y^2$

$\Delta A = \pi (16 - y^2) \Delta y$

$f(x) = \pi (16 - x^2)$

$lram(-4, 4, 100)$

Oct 31-9:43 AM